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IN THE
Supreme Court of the United States

No. 79-136

SIDNEY A. DIAMOND,
COMMISSIONER OF PATENTS AND TRADEMARKS,
Petitioner

v.

ANANDA M. CHAKRABARTY,
Respondent

**On Writ of Certiorari to the United States
Court of Customs and Patent Appeals**

**BRIEF AMICUS CURIAE OF
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA**

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BRIEF AMICUS CURIAE OF
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

This brief is filed pursuant to written consent of all the parties. Copies of the consent letters are concurrently being lodged with the Clerk.

INTEREST OF THE AMICUS CURIAE

The University of California is an institution of higher learning, established by the State of California, governed by the corporation, the Regents of the University of California (California Constitution, Art. IX, Sec. 9).

The University operates nine campuses, as well as a number of research centers, both within and outside the State of California. As a part of its educational and related activities, the University sponsors research in many fields of endeavor, including various aspects of microbiology. The University is the primary research instrumentality established by the state under the master plan for higher education for the State of California (Cal. Education Code, § 66500). The University is active in obtaining patents on inventions made in the course of its research. These patents are licensed to industry, and the proceeds after deduction of the cost of obtaining such patents are divided between the inventor and the University. The University uses its portion to sponsor further research.

Inventions arising from the University's own research, which are the subject of pending patent applications, are analogous in many respects to the Chakrabarty invention before the Court. Thus, the Chakrabarty invention involved the selection of a variety of "hereditary units" called "plasmids" (P. Br. 6)¹ from various different individual known bacteria, each having the capability to degrade only individual crude oil components, and the insertion of these plasmids into a single host cell to form a new microorganism in which all of the plasmids for the first time cooperate to metabolize spilled oil.

Relevant inventions made at the University likewise entail the insertion of man-made plasmids containing genes from other organisms into a host microorganism. For example, the University's inventions involve the preparation and insertion into a strain of *E. coli* of plasmids containing mammalian genes which express various proteins such as insulin and growth hormone, in great demand for therapeutic purposes.

¹ See P. Br. 6, including footnote 3.

Whether the University has the right to patent its own newly manufactured microorganisms will depend directly on the disposition that is made in this case.² In turn, this will govern whether the University receives income from these inventions, to be significantly shared with its inventors and to use, *inter alia*, in supporting new research. Indeed, if no patents issue, the health care industry may well elect not to commercialize these important inventions because of its avowed belief that absent the protection a patent affords, the time and experimental work requisite to obtaining government clearances cannot be justified.

STATEMENT OF THE CASE

An appropriate Statement of the Case appears in the brief of the parties.

² Pending the decision in this case, the Patent Office has suspended all action on the University's current patent applications, not only as to the claims for microorganisms *per se*, but also for related subject matter such as "vectors," i.e., chemical compounds, which are not "living".

A typical December 11, 1978 statement of the Patent Office position is

This application contains claims drawn to a cloning vector (e.g., a plasmid) and a microorganism *per se*.

Since the claimed subject matter may be affected by the decisions in the *Bergy, et al.* . . . and *Chakrabarty* . . . applications currently before the Court of Customs and Patent Appeals, *action in this case is suspended until final adjudication of those cases.*

Applicants should call this case to the Examiner's attention if they have not received any action within 6 months. (Emphasis by the Patent Office.)

On November 23, 1979, the Patent Office rejected a request for "action on the merits" of only those claims not drawn to a microorganism, *inter alia*, because "the claims to 'a plasmid' and 'a vector' [both nonliving chemical compounds] are considered to be drawn to subject matter that may be affected by the Supreme Court decision."

SUMMARY OF ARGUMENT

The narrow issue solely presented for adjudication is not whether all "living organisms" are patentable, but whether the new and useful microorganism which respondent created by inserting man-made plasmids into a host cell is a "manufacture" under 35 U.S.C. § 101.

As this Court held in *American Fruit Growers, Inc. v. Brogdex*, 283 U.S. 1, 11 (1931), the word "manufacture" in the statute, given its ordinary meaning, contemplates "transformation; a new and different article must emerge 'having a distinct name, character or use.'"

Petitioner's microorganism satisfies these criteria. Hence, the Court's "duty" as defined in *Parker v. Flook*, 437 U.S. 584, 596 (1978) to "construe the patent statutes as they now read in light of our prior precedents" requires affirmance without reference to any legislative history.

Petitioner's excursion into a synthetic legislative history is unwarranted and misdirected. The practical application of the existing patent laws largely excluded "life forms" not because they were alive—a factor not mentioned by the Congress—but because they were either "products of nature" and hence not "new" (R.S. 4886; 35 U.S.C. § 101) or because the statutory requirements for a detailed written description and for precise claiming (R.S. 4888; 35 U.S.C. § 112) could not be satisfied, *inter alia*, because such inventions did not reproduce true to form, i.e., were not "stable".

Because the petitioner, with approbation of the lower court, has already accommodated the description requirements of § 112 to the exigencies of microbiological technology (see *Application of Argoudelis*, 434 F.2d 1390 (1970)), no statutory impediment to the patenting of manufactured microorganisms remains.

This Court should not be distracted from these basic principles which augur strongly for affirmance by the CCPA's specious legal reasoning which seemingly seeks to induce a reversal or compromise of the high patentability "standard expressed in the Constitution" (*Graham v. John Deere Co.*, 383 U.S. 1, 6 (1966) unvaryingly enforced here.

Rather, the categories of patentable subject matter set forth in 35 U.S.C. § 101 should be liberally construed to limit the number of inventors who have "no reason to apply for a patent" (See *Kewanee Oil Co. v. Bicron*, 416 U.S. 470, 483 (1974)) and promote progress by public disclosure of their inventions concomitantly with the rigorous enforcement of the constitutional patentability standard subsumed in 35 U.S.C. § 103.

ARGUMENT

I. The "Question Presented"

The "Question Presented" by the petition is "overly broad, which is calculated to magnify its importance"³ and permit petitioner to appeal to emotion, especially those vague and unreasoned fears about possible future achievements of microbiological research that seem to be fashionable at present.⁴ Asserting that the CCPA has made a "decision to extend the patent laws from the nonliving to the living" (P. Br. 38, n. 44), petitioner endeavors to distract this Court from both the specific

³ CCPA opinion, Pet. App. 45a. The "Question Presented" originated in the Petition for a Writ of Certiorari in No. 77-1503, *Parker v. Bergy*. On June 26, 1978, that Petition was granted, 438 U.S. 932, the judgment of the Court of Appeals was vacated and the cause remanded "for further consideration in light of *Parker v. Flook* . . . 437 U.S. 584."

⁴ See generally the brief *amicus curiae* on behalf of the People's Business Commission endorsed in part by Petitioner at P. Br. 19.

man-made microorganism at hand and the controlling, unambiguous, statutory language which has appeared in every patent law from 1790 to the present.⁵

As the CCPA correctly explained, *in this case* "[w]e are not dealing with all living things . . . all 'organisms'" (Pet. App. 45a). *Per contra*, at issue here is a man-made microorganism, which the court below held to be a "manufacture" within the penumbra of that term as used in apposite statutes since the inception of the patent system.

Petitioner acknowledges that the "CCPA . . . disavowed any intent to suggest the patentability of life forms other than microorganisms (Pet. App. 45a)" but justifies its uncabined "nonliving"-*"living"* synthesis by the assertion that such court "failed, however, to suggest why its conclusion concerning the scope of Section 101

⁵ Since enactment of § 1 of the Patent Act of 1790, 1 Stat. 109, "*any* useful . . . *manufacture* . . . not before known or used" (emphasis added) has been eligible for patent protection.

The Patent Act of 1793, 1 Stat. 318, section 1, permitted patents to be issued to persons who "have invented or discovered any useful art, manufacture, engine, machine, or device, or any improvement therein. . . ." The superseding Act of 1836, 5 Stat. 117, provided, in section 6, for issuance of patents to persons "having discovered or invented any *new* and useful art, machine, manufacture, or composition of matter, or any new and useful improvement on any art, machine, manufacture, or composition of matter. . . ."

The 1870 Act, 16 Stat. 198, recodified as R.S. 4886 (1874), which subsisted without material change until the 1952 enactment of 35 U.S.C. § 101, provided that

Any person who has invented or discovered any *new* and useful art, machine, *manufacture*, or composition of matter . . . may . . . obtain a patent therefor.

The Reviser's Note for § 101 states:

Section 101 follows the wording of the existing statute as to the subject matter for patents, except that reference to plant patents has been omitted for incorporation in section 301 and the word "art" has been replaced by "process", which is defined in section 100. . . .

would not also apply to other living organisms. . ." (P. Br. 17, n. 16).

The CCPA, however, had been advised, and undoubtedly *knew*, even if it did not say so expressly, that single cell organisms are not only non-individualistic—i.e., they reproduce precisely⁶—but are also mindless, soulless and brainless.⁷

As the CCPA was also advised, it is now well established that living gene cells, as distinguished from higher multicellular organisms, obey the same laws of chemistry and physics, as nonliving cells.⁸

⁶ "Mitosis provides a precise and elegant mechanism for ensuring that two daughter cells each acquire a set, or sets, of chromosomes identical with those of the parent cell. Since, as we shall see, the chromosomes are indeed the bearers of the hereditary determinants, each daughter cell and its descendants will thus carry the same genotype as the initial parental cell. Such a population of genetically identical cells, derived from the multiplication of a single cell, is called a *clone*, while the process which gives rise to it is variously known as *mitotic*, *vegetative* or *asexual* reproduction. This is the way in which plant cuttings propagate themselves, damaged tissues are regenerated and bacteria multiply in a broth culture; in all these cases we expect, and nearly always find, that the new plant, tissue or bacterial culture is identical with the old one. On the contrary, when people or dogs or insects or many kinds of plant reproduce themselves we no longer anticipate that the offspring will be identical with each other and are rather surprised if they are. . ." Hayes, *The Genetics of Bacteria and Their Viruses*, 2d ed., John Wiley & Sons, Inc., New York (1968) at 11-12.

⁷ See the brief *amicus curiae* of the Regents of the University of California before the CCPA, pp. 14-16.

⁸ For example, Stent, *Molecular Genetics*, W. H. Freeman & Co., San Francisco (1971), at p. 28, notes that during the 1940's many physicists departed from their background and training to study gene cells "[i]nspired by the romantic notion of finding 'other laws of physics'" besides those then known and sums up "Alas, the physicists were to be cheated out of their reward: no 'other laws of physics' had turned up along the way." Instead . . . the making and breaking of hydrogen bonds seem to be all there is to understanding the workings of the hereditary substance." And Watson, *Molecular Biology of the Gene*, 2d ed., W.A. Benjamin & Co., New

Because microorganisms reproduce identically and function predictably once made, their patenting cannot have the social, moral or ethical overtones that might arise if dogs, cats, people, or honeybees were in issue. It follows that petitioner's arguments along these lines (e.g. P. Br. 10, 20) are irrelevant.

II. "Areas . . . Unforeseen by Congress"

35 U.S.C. § 101 in terms affords a possibility of patent protection to "[w]hoever invents or discovers *any* new and useful . . . manufacture. . . ." It does not restrict such a "manufacture" in any way, whether to "nonliving" subject matter or otherwise. Indeed, its use of the word "*any*" seems to be deliberately broad and all-inclusive, mirroring the equally wide scope of every predecessor statute since 1790.⁹

Nevertheless, petitioner invites this Court, in the guise of "strict construction" of this broadly worded statute, to imply—and thus legislate¹⁰—a "nonliving" limitation into the statutory scheme. Petitioner's pretext is its out-of-context interpretation of the caveat in *Parker v. Flook*, 437 U.S. 584, 596 (1978) that:

It is our duty to construe the patent statutes as they now read, in light of our prior precedents, and

York (1970) at p. 67, emphasizes that "not only . . . [are] the laws of chemistry . . . sufficient for understanding protein structure, but also . . . they are consistent with all known hereditary phenomena."

Highly skilled scientists in the field of microbiology have difficulty drawing bright lines between "living" and "nonliving" single cells. The question, e.g., of whether viruses are "living" or "nonliving" is not yet settled. See National Geographic, Vol. 150, pp. 355-95 at 386 (Sept. 1976).

⁹ See note 5, *supra*, p. 4.

¹⁰ "We should not read into the patent laws limitations and conditions which the legislature has not expressed." *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 199 (1933).

we must proceed cautiously when we are asked to extend patent rights into areas wholly unforeseen by Congress. . . .

The petitioner's suggestion, of course, is that new microorganisms, like the new computer-implemented algorithm in *Flook*, were "wholly unforeseen" by Congress and therefore should not be patented. But in proper context, *Flook* cannot be read to require that the only specific new technology which is eligible for patenting is that foreseeable by Congress. Such a suggestion borders on impossibility. Were Congress blessed with such prophetic insights, patents would be superfluous.

Against the background of *Flook*, this Court necessarily meant its words "areas wholly unforeseen by Congress" to connote, e.g., abstract ideas and natural phenomena, which have always been held to be outside the ambit of § 101 and predecessor statutes. Congress has repeatedly placed its imprimatur upon this Court's pronouncements to the effect that § 101 excludes as unpatentable "a hitherto unknown phenomenon of nature,"¹¹ "a scientific truth or the mathematical expression of it,"¹² "a principle in the abstract . . . , an original cause, a motive,"¹³ "[p]henomena of nature, . . . mental processes . . . , abstract intellectual concepts,"¹⁴ and "a mere principle."¹⁵

In contrast to the algorithm that was at stake in *Flook*, the claims before the Court do not fall within this precluded realm. Rather, the present claims define a new,

¹¹ *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

¹² *Mackay Radio and Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 94 (1938).

¹³ *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972), quoting from *LeRoy v. Tatham*, 55 U.S. (14 How.) 156, 175 (1852).

¹⁴ *Gottschalk*, *supra*, 409 U.S. at 67.

¹⁵ *Tilghman v. Proctor*, 102 U.S. 707, 729 (1880).

man-made, industrially useful microorganism not available in nature.

Petitioner's argument that this subject matter cannot be patented under the existing statute because "wholly unforeseen by Congress" suggests that our patent law is and has always been ineffective "to promote the progress of science and useful arts," as the Constitution directs it should. Manifestly, the Congress which formulated the 1790 statute authorizing "*any . . . useful manufacture*" to be patented *intended* that then unimagined technologies would qualify.¹⁶

III. Flook Mandates Affirmance

In contrast to *Flook*, where precedent "foreclose[d] a purely literal reading" (437 U.S. at 589) of the word "process"—new to the statute in 1952—the apposite decisions require that "manufacture" which has always been used by Congress to identify patentable subject matter be construed in the "ordinary sense of the word." *Ibid.*, at 588.

¹⁶ The legislative history of the 1930 Plant Patent Act emphasizes that:

[T]here are many instances where the provisions of the Constitution have been held to embrace affairs which, while literally within the meaning of a constitutional phrase, were not conceived of by the framers at the time that the Constitution was written. For example, the power to regulate interstate commerce, which was then mainly by horse or by rowboat or sailboat is now held by the courts to cover regulation of steam transportation, telegraphic communication, and even radio communication, matters beyond the wildest dreams of the framers of the Constitution. Senate Report 315, 71st Cong., 2d Sess. (1930), p. 9 and House Report 1129, 71st Cong., 2d Sess. (1930).

In *Graham v. John Deere Co.*, 383 U.S. 1, 19 (1966), the Court noted that:

Technology, however, has advanced—and with remarkable rapidity in the last 50 years. Moreover, the ambit of applicable art in given fields of science has widened by disciplines unheard of a half century ago. . . .

"It is elementary that '[t]he starting point in every case'—including this one—'involving the construction of a statute is the language of the statute itself,'" *Southeastern Community College v. Davis*, — U.S. —, 60 L.Ed.2d 980, 987-8 (1979); *Perrin v. United States*, — U.S. —, 48 L.W. 4009, 4111 (1979); *Andrus v. Allard*, — U.S. —, 48 L.W. 4013, 4014 (1979) and "that unless otherwise defined words will be interpreted as taking their ordinary, contemporaneous common meaning. *Burns v. Alcola*, 420 U.S. 570, 580-581 (1975)." *Perrin*, *supra*.

In 1931, this Court considered the question:

Is an orange, the rind of which has become impregnated with borax, through immersion in a solution, and thereby rendered resistant to blue mold decay, a "manufacture," or manufactured article, within the meaning of § 31, title 35, U.S.C.? ¹⁷

The word "manufacture" not being "otherwise defined" in the patent statutes, the court adopted the "ordinary, contemporaneous common meaning" of the word as set forth in the Century Dictionary and in its prior decisions in tariff cases, to answer the question in the negative:

"Manufacture," as well defined by the Century Dictionary, is "the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery." Also, "anything made for use from raw or prepared materials."

Addition of borax to the rind of natural fruit does not produce from the raw material an article for use which possesses a new or distinctive form, quality or property. The added substance only pro-

¹⁷ *American Fruit Growers, Inc. v. Brogdex Co.*, 283 U.S. 1, 11 (1931).

fects the natural article against deterioration by inhibiting development of extraneous spores upon the rind. There is no change in the name, appearance, or general character of the fruit. It remains a fresh orange fit only for the same beneficial uses as theretofore.

.....

[I]n *Anheuser-Busch Asso. v. United States*, 207 U.S. 556, 562, 52 L.ed. 336, 338, 28 S.Ct. 204, where it was claimed that corks for bottles which had undergone special treatment after importation thereby became articles manufactured in the United States, this court said: "Manufacture implies a change, but every change is not manufacture, and yet every change in an article is the result of treatment, labor and manipulation. But something more is necessary, as set forth and illustrated in *Hartman v. Wiegmann*, 121 U.S. 609, 30 L.ed. 1012, 7 S.Ct. 1240. *There must be transformation; a new and different article must emerge 'having a distinctive name, character or use.'*" (Emphasis added.) 283 U.S. at 11-13.

This construction of "manufacture" was unquestionably known to the Congress when the pertinent portion of the statute was re-enacted without change in 1952.¹⁸ The Court can thus "have no doubt that Congress has ratified the statutory interpretation of" *American Fruit Growers, Inc., supra. Douglas v. Seacoast Products, Inc.*, 431 U.S. 265, 278-9 (1977).

¹⁸ The 1952 Act was carefully nurtured through Congress by a group of patent lawyers and Patent Office employees, wholly cognizant of the decisional law, who sought no change in the word "manufacture," while concurrently causing the word "art" in the existing statute to be changed to "process". See, e.g., H.R. 1928, 82d Cong., 2d Sess., "Revision of Title 35, United States Code, PATENTS"; Report from the Committee on the Judiciary, House of Representatives, May 12, 1952, p. 2 (History of the Present Bill); Federico, *Commentary on the New Patent Act*, 35 U.S.C.A. 1 (1954); Rich, *Congressional Intent or Who Wrote the 1952 Patent Act*, 61 Patent Procurement and Exploitation 70 (1963) and the Reviser's Note quoted *supra*, note 5, page 6.

Chakrabarty's new and useful microorganism is indeed a "transformation; a new and different article [microorganism] 'having a distinctive name, character or use,'" i.e., to clean up spilled oil—and, hence, is a "manufacture" within the meaning of § 101.¹⁹

IV. The Real "Legislative History" Mandates Affirmance

The settled and clear meaning of the word "manufacture" as used in § 101 should be dispositive without any reference to legislative history.

Petitioner, however, disdaining any reference to § 101's predecessors, the "contemporaneous . . . meaning" of the terms, or *American Fruit Growers, Inc.*, posits its case for extensive reference to a synthetic "legislative history" (see P. Br. 11, 21, *et seq.*) solely on its *ipse dixit* that the "key words manufacture or composition of matter . . . hardly define themselves" (P. Br. 30).

This excursion into a constructed legislative history is both unwarranted and misdirected. The practical application of the existing patent laws largely excluded "life

¹⁹ The petitioner admits as much:

Certain strains of *Pseudomonas* bacteria existing in nature are capable of degrading by enzymatic reactions a particular component of a complex hydrocarbon, such as crude oil, but no known naturally-occurring bacterium can degrade more than one such component. Chakrabarty employed so-called "genetic engineering" to develop a *Pseudomonas* bacteria capable of degrading more than one component of crude oil (Pet. App. 142a-143a).³

³ Plasmids, which are hereditary units separate from the chromosomes, carry the hydrocarbon-degrading capacity of the cell. Chakrabarty utilized a process of natural conjugation (A. 41, 46) to effectuate the transfer to a single cell of plasmids from various known strains of bacteria, each known to have a specific capacity to degrade a particular component of crude oil (A. 46-50). The resulting organism, which Chakrabarty seeks to patent, is a bacterium with increased hydrocarbon-degrading capacities due to the different kinds of plasmids it contains (Pet. App. 143a). (P.Br. 6)

forms," not because they were alive²⁰—a factor not mentioned by the Congress²¹—but because they were either "products of nature" and hence not "new" (R.S. 4886; 35 U.S.C. § 101) or because the statutory requirements for a detailed written description and for precise claiming (R.S. 4888; 35 U.S.C. § 112) could not be satisfied, *inter alia*, because such inventions did not reproduce true to form, *i.e.*, were not "stable".²²

A. Natural Products are not "New"

The truism that natural products, *per se* and as synthesized by man, are not "new" and hence constitute unpatentable subject matter dates at least from the 1884

²⁰ Petitioner argues that:

Inanimate inventions relating to agriculture had always been covered by the patent law; the *only* reason that legislation [*i.e.*, the 1930 Plant Patent Act and the 1970 Plant Variety Protection Act] was required was because the subjects to be newly protected were alive. . . . That legislation does not encompass Chakrabarty's invention; accordingly, it is not patentable. (P.Br. 11)

.....
The very fact that Congress [in 1930] added these [plant patent] provisions to the predecessor of Section 101 strongly indicates a congressional understanding that the terms "manufacture, or composition of matter" did not extend to living things, for otherwise the new authorization . . . would have been redundant. . . .

.....
Similarly the Plant Variety Protection Act . . . enacted in 1970 . . . would be redundant under the reading of section 101 adopted by the court below, for under that reading living things already were patentable as "'manufacture[s], or composition[s] of matter.'" (P.Br. 22-23)

²¹ As the CCPA put it, the petitioner's argument attributes to Congress an intent that its "members did not themselves state" (Pet. App. 51a).

²² Higher organisms do not reproduce truly, and hence remain unpatentable. See Hayes, *supra*, n. 6, p. 7.

decision of this Court in *Cochrane v. Badische Anilin and Soda Fabrik*, 111 U.S. 294.²³

Most "life forms", at least prior to 1930, were products of nature which failed to satisfy the statute's requirement that only "new" manufactures and compositions of matter could be patented.²⁴ Indeed, as petitioner admits, the 1930 Plant Patent Act "carefully distinguished between products of nature . . . and products of man" (P. Br. 33).²⁵

²³ According to the description in No. 95465, and in No. 4321, and the evidence, the article produced by the process described was the alizarine of madder, having the chemical formula $C_{14}H_8O_4$. It was an old article. While a new process for producing it was patentable, the product itself could not be patented, even though it was a product made artificially for the first time, in contradistinction to being eliminated from the madder root. Calling it artificial alizarine did not make it a new composition of matter, and patentable as such, by reason of its having been prepared artificially for the first time from anthracine, if it was set forth as alizarine, a well known substance. The Word Paper Patent, 23 Wall., 566, 593 [90 U.S. XXIII, 31, 39] 111 U.S. at 311.

This ruling sustains an averment in the answer that "alizarine is a natural product . . . ; that it is not a composition of matter within the meaning of the statute [predecessor of § 101, see n. 5, *supra*, p. 6], but has been well known in the arts," *i.e.*, not "new". 111 U.S. at 297.

The same rule was applied, in 1889, to natural plant products in *Ex Parte Latimer*, 1889 Dec. Comm. Pat. 423.

²⁴ As the CCPA points out: "The secondary purpose of the Plant Patent Act was to avoid the judicial interpretation which had been placed on then-existing patent laws that *products of nature* are not statutory subject matter. Until the time that Burbank made famous the art of plant breeding, plants were regarded as products of nature, unaffected by the hand of man, and thus not subject to patent protection" (Pet. App. 59a, citing Wegner, *The Patentability of "New Manufactures"—The Living Invention*, "The Product of Nature of Early Days," 1978 Patent Law Conference Coursebook (BNA) 274-80) (emphasis by the court).

²⁵ P.Br. 33, n. 40 adverts to "work in plant genetics and breeding," *i.e.*, man-made plants, which substantially preceded the 1930 Plant

These same considerations devitalize petitioner's argument premised on two casual references from the legislative history suggesting that Congress, in adopting the 1930 Patent Act, was discriminating broadly between animate and inanimate things.²⁶

Applying the same reasoning to bacteria, the CCPA in 1974 presumed "without deciding" that the microorganism recited in the process claim before it was not patentable because it was a "product of nature" and hence "lacked novelty".²⁷

Patent Act to invite the spurious inference that plants are excluded from the existing statute *solely* because they are alive. However, "living organism" inventions were in no event patentable because of inability to satisfy the detailed written description and precise claiming requirements of R.S. 4888.

²⁶ The quotation at P.Br. 32 from H.R. Rep. No. 1129 at p. 7 and S. Rep. No. 315 at p. 6 which adverts to a "distinction between the discovery of a new variety of plant and of certain inanimate things, such, for example, as a . . . mineral," is followed in the next sentence by an explanation of the "distinction," in effect, that the "mineral" is an unpatentable product because it is "created wholly by nature unassisted by man," whereas new asexually propagated plants are not "reproduced by nature unaided by man."

Secretary of Agriculture Hyde's understanding (see P.Br. 24, *et seq.*) that "the patent laws . . . at the present time . . . cover only inventions or discoveries in the field of inanimate nature" is meaningful in the same "product of nature" context and does not at all require that the constraint deemed by Hyde to restrict patents to inanimate things was consequent solely, or at all, from the fact that *animate* things are *alive*.

²⁷ The CCPA's decision in *Application of Mancy*, 499 F.2d 1289, 1294 (1974) states in dicta:

Here appellants not only have no allowed claim to the novel strain of *Streptomyces* used in their process but would, we presume (without deciding), be unable to obtain such a claim because the strain . . . is, as we understand it, a "product of nature"

In this case, rebutting a representation in the first Bergy petition, No. 77-1503, p. 6 that the CCPA in *Mancy* "suggested" that "living things" are not patentable, the CCPA was at pains to state the obvious—i.e., "we now make it explicit that the thought underlying

B. The Written Description and Precise Claiming Requirements of R.S. 4888

R.S. 4888, the predecessor to 35 U.S.C. § 112 (1952), provided that

Before any inventor or discoverer shall receive a patent . . . he shall . . . file in the Patent Office a written description of the same, and the manner and process of making, constructing, compounding, and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make, construct, compound, and use the same . . . and he shall particularly point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery. . . .

The fact that plants were not amenable to the detailed description and to the precise claiming requirements of that statute was called to the attention of the Congress by a memorandum from the Commissioner of Patents, Thomas E. Robertson, to the Secretary of Commerce, R. P. Lamont, which appears in the legislative history:

Further, and more important, there at once arises the difficulty of defining in a written document which must be printed, both as constituting part of the

our presumption that Mancy could not have obtained a claim to the strain of microorganism he had described was simply that it *lacked novelty*" (emphasis by the court) (Pet. App. 46a).

Nevertheless, to somehow justify its reiteration of the same misrepresentation, petitioner now says that Mancy's microorganism "was . . . like Bergy's biologically pure culture . . . which the same judges who decided Mancy found 'did not define a product of nature' (Pet. App. 39a)" (P.Br. 14, n. 13).

There is no such inconsistency. *Mancy* does not advert to a "microbiologically pure culture" as claimed by Bergy, or raise the issue of whether such a culture is a "product of nature." As the petitioner stresses, "the question involved" in both Bergy and Chakrabarty "is an issue of first impression" (P.Br. 13).

patent and as constituting a publication available for search and distribution, the differences which identify a new variety from previously known varieties. . . .

If it is not possible by ordinary description of the physical qualities of the plant, or the fruit, or the bloom, or all three, to so accurately define this new variety that it can be differentiated from all known varieties and from all subsequently created new varieties, then it is difficult to see how a patent to be granted would comply with the other provisions of the statutes, namely, that the inventor must describe his invention in full, clear, concise and exact terms.²⁸

Congress' response, concurrently with the amendment of R.S. 4886, to permit the patenting of "any new . . . asexually reproduced . . . distinct and new variety of plant, other than a tuber-propagated plant" was to also amend R.S. 4888 to accommodate the description problem by providing that "No plant patent shall be declared invalid on the ground of noncompliance with this section if the description is made as complete as is reasonably possible."

Shortly thereafter, the Patent Office practice with respect to the claiming requirement of R.S. 4888 was changed to provide, as later codified in 35 U.S.C. § 162 (1952), that "The claim in the specification shall be in formal terms to the plant shown and described."²⁹

Apparently, to buttress its contention that Congress in 1930 "made a limited class of living things patentable"

²⁸ A Bill to Provide for Plant Patents: Hearings on H.R. 11372 before the Commissioner of Patents, 71st Cong., 2d Sess. 7 (1929-30) (statement of Hon. Fred S. Purnell).

²⁹ The Reviser's Note states that "The second [above-quoted] paragraph is not in the [prior] statute [R.S. 4888] but represents the actual practice."

(P. Br. 35), by inference a class which *excludes* microorganisms, petitioner says that the Plant Patent Act "provided patent protection only to *certain* (P.Br. 33) man-made plants. The exclusions—only of *non*-asexually reproduced plants and "tuber-propagated" plants—were explained by Congress on other grounds:

All plants must be asexually reproduced *in order to have their identity preserved*. This is necessary since seedlings either of chance or self-pollination from any of these would not preserve the character of the individual.³⁰

. . . .

Substantially the only plants covered by the term "tuber-propagated" would be the Irish potato and Jerusalem artichoke. This exception is made because

³⁰ Petitioner acknowledges that, "the objection to including sexually reproduced plants under the 1930 Plant Patent Act had been that new varieties could never be reproduced true-to-type through seedlings. S.Rep. No. 315, *supra* at 4; H.R. No. 1129, *supra* at 4-5" (P.Br. 27, n. 31).

This same fact is acknowledged in the 1968 Congressional hearings on patent law revision. "Asexual reproduction is specified in the Plant Patent Act because this method of propagation generally insures the continuation of the new and distinct characteristics of the plant through succeeding generations." ("Patent Law Revision," Hearings Before the Subcommittee on Patents, Trademarks and Copyrights of the Committee on the Judiciary, U.S. Senate, 90th Cong., 2d Sess., part 2, January 30, 31 and February 1, 1968, p. 651.)

In 1940, the CCPA held that bacteria, which *do* reproduce true to form, are not plants and hence not patentable under the 1930 Act. *In re Arzberger*, 112 F.2d 834. The decision has been criticized. See Parker, 22 J.Pat.Off.Soc'y 622 (1940); Note, 33 Minn.L.Rev. 430 (1949); Daus, 10 Idea 87 (1966) and Irons and Sears, *Patents in Relation to Microbiology*, 29 Ann.Rev. of Microbiology 319 (1975).

The latter paper notes that the Arzberger patent application contained a single claim to a defined "bacteria" and that the CCPA acknowledged that bacteria "are scientifically classified as plants" but concluded that "Congress, in the use of the word 'plant' was speaking 'in the common language of the people' and did not use the word in its strict scientific sense." 112 F.2d at 838.

this group alone, among asexually reproduced plants, is propagated by the same part of the plant that is sold as food. H.R. Rep. No. 1129, 71st Cong., 2d Sess. (1930) 4, 6; S.Rep. 315, 71st Cong., 2d Sess. (1930).

The 1970 Plant Variety Protection Act followed only after the evolution of the art obviated the same description problem with respect to seeds:

In the 37 years which have passed since the enactment of the Plant Patent Act improved breeding techniques and seed multiplication procedures have become established whereby many plant varieties may be reproduced from seeds true to form. Such ability of plant varieties to reproduce true to form from seeds is not acknowledged in existing legislation, such as the Federal Seed Act which was enacted August 1939, and seed certification. It accordingly follows that the distinction drawn in the Plant Patent Act between plants which reproduce asexually and plants which reproduce sexually is artificial, and that the act should be broadened to include plants which reproduce sexually.³¹

As in the case of plant patents, the description requirements for a plant variety protection certificate are generalized. Only "a description of the variety setting forth its novelty and a description of the genealogy and breeding procedure, when known" is required, 7 U.S.C. § 2402. Nor is any formal, precise claim required as in § 112 of the patent statutes.³²

³¹ Statement of Floyd S. Ingersoll, "Patent Law Revision," Hearings Before the Subcommittee on Patents, Trademarks and Copyrights of the Committee on the Judiciary, U.S. Senate, 90th Cong., 2d Sess., Pursuant to S.Res. 27 on S. 2, S. 1042 S. 1377, S. 1691, S. 2164 and S. 2597, Part 2, January 30, 31 and February 1, 1968, pp. 638, 640.

³² The *Plant Variety Protection Office Journal*, Vol. 7, No. 3 (July-Sept. 1979) includes the following certificates:

V. Accommodation of Microbiological Process Patents to the Requirements of 35 U.S.C. § 112

Patent applications pertaining to microbiological processes encountered problems similar to those which initially precluded the patenting of asexually reproduced plants and seeds. Such inventions, particularly those in which the sole novelty resided in the microorganism utilized, could not be patented unless and until a procedure for satisfying the written description and precise claiming requirements of the statute could be satisfied.³³

By 1970, these difficulties had been overcome—not by amendment of the statute—but by Patent Office regulations requiring the deposit, in a collection accessible to the public, of a culture of the microorganism at the time or before the patent application is filed.³⁴

The CCPA dealt with the matter, with specific reference to the analogous problem as regards asexually reproduced plants, in *Application of Argoudelis*, 434 F.2d 1390 (1970). In *Argoudelis*, the claimed invention included a process for producing an antibiotic by fermenta-

No. 7700106 for "Wheat" identified as "5466"—"5466" most closely resembles '5422'; however, '5466' has an inclined spike at maturity, where as the spike of '5422' is erect."

No. 7900017 for "Lettuce" identified as "Coolguard"—"Coolguard" most closely resembles 'Winterhaven' and 'Vanguard'; however, 'Coolguard' has a lighter yellow flower color than 'Winterhaven' and 'Vanguard' (4D VS 6C and 6D Royal Horticultural Society Colour Chart)."

³³ See generally, Levy and Wendt, *Microbiology and a Standard Format for Infra-Red Absorption Spectra in Antibiotic Patent Applications*, 37 J.Pat.Off.Soc'y 855 (1955).

³⁴ Under the present Patent Office practice, the deposit must be irrevocable, of a permanent character and made under conditions which insure free availability of samples of the microorganism to the public at the time that a patent actually issues. Section 608.01(p) of the Manual of Patent Examining Procedure (Rev. 39, Jan. 1974).

Such deposits were made by Chakrabarty (Pet. App. 31a) and Bergy (P.Br. 4, n. 1).

tion with the microorganism *Streptomyces sparsogenes* var. *sparsogenes*. The Patent Office had rejected the claims "as based on a deficient disclosure [of the microorganism] under 35 U.S.C. § 112" (434 F.2d at 1391-2). The CCPA held:

Appellants, however, because of the particular area of technology involved, cannot sufficiently disclose by written word how to obtain the microorganism starting material from nature.

It has been pointed out in the Amicus Curiae brief that the same predicament exists in the case of asexually reproduced plants. In regard to plants, a general dispensation from the requirements of § 112 has been accorded by 35 U.S.C. § 162. It is urged that the same should be true here. We do not believe that a general dispensation from the statutory requirements of § 112 in the case of microorganisms is necessary, desirable, or within the province of this court to grant. Our task here is not to decide what the general rule should be or to create exceptions to the provisions of § 112, but rather to interpret and apply § 112 to the facts of the case before us. . . .

As mentioned, a unique aspect of using microorganisms as starting materials is that a sufficient description of how to obtain the microorganism from nature cannot be given. . . .³⁵ The microorganism involved here, of course, was not known and available to the workers in the art since it was newly discovered by appellants.

³⁵ The fact that a new microorganism can be fully "described" only by a reference to a physical specimen, rather than in words, makes it particularly susceptible to suppression as trade secrets known to an elite few.

It is important to the public that the patent incentive be available to the inventors of today's new man-made microorganisms, such as that of Chakrabarty, so as to insure that the existing new knowledge they represent is not suppressed, but is disclosed to the public by the normal operation of the patent laws.

Faced with this problem, and in response to the requirements of § 112 for an enabling disclosure, appellants deposited cultures of their microorganism in a public depository in the United States. This was done before the United States patent application was filed. The written description as originally filed included the name of the depository and its designation of the deposit, in addition to a complete taxonomic description of the microorganism and detailed disclosure of the process for producing the antibiotic from the microorganism. The cultures are to be made available to the public upon issuance of a United States patent which refers to such deposit and prior to issuance of said patent under the conditions specified by Rule 14. Appellants state that the practice of depositing cultures in a public depository has been used for over fifteen years.

It is our opinion that this procedure meets the requirements of 35 U.S.C. § 112. . . . (Footnote omitted.) 434 F.2d at 1392-3.

This procedure is equally effective to provide a "written description" adequate under § 112 *without regard to whether* the claims cover a microorganism *per se*, a composition of which the microorganism is a major ingredient or a process for using the microorganism to produce a desired product.³⁶

³⁶ Historically, working models were required by the Patent Office as an aid to describing mechanical and electrical devices. The Patent Office up to the present time requires drawings under 35 U.S.C. § 113 and 37 C.F.R. § 1.81 in any case which admits of them, for the same purpose of augmenting written description. In addition, working models (37 C.F.R. § 1.91) or specimens of chemicals (37 C.F.R. § 1.93) may be required to be furnished if the Patent Office deems either would aid in promoting understanding of the invention. A similar situation prevails with respect to asexually propagated plants. Drawings are required in every application (37 C.F.R. § 1.165) and specimens, at any growth stage, may be required at the discretion of the Patent Office (37 C.F.R. § 1.166).

VI. Affirmance is Appropriate Despite Incorrect Reasoning Below

The Court should not be deflected from affirming the judgment below—the only issue before it—by the significant errors in legal analysis which permeate the majority opinion. As cogently evidenced by the consistent reversal of its decisions here,³⁷ the CCPA tends toward legal error and has long waged war against this Court's venerable and unvaried interpretations of the patent laws. One of the most tenacious, maintained errors is an insistence that the 1952 Patent Act significantly changed the law, disqualifying as precedent the pre-1952 opinions of this Court and lower federal courts and even of the CCPA itself.³⁸

³⁷ See *Brenner v. Manson*, 383 U.S. 519 (1966); *Gottschalk v. Benson*, 409 U.S. 34 (1972), *Dann v. Johnston*, 425 U.S. 219 (1976) and *Parker v. Flook*, 437 U.S. 584 (1978).

³⁸ H.Rep. 1928, 82d Cong., 2d Sess. (1952), which accompanied the 1952 Patent Act at passage, emphasized that notwithstanding "a number of changes in substantive statutory law"—one of the main ones being the inclusion of "a requirement for invention in § 103"—"the principal purpose of the bill is the codification of title 35, United States Code and involves simplification and clarification of language and arrangement, and elimination of obsolete and redundant provisions . . ." (p. 5). See also S.Rep. No. 1979, 82d Cong., 2d Sess. (1952).

Disdaining this and other similar aspects of that Act's legislative history, the CCPA's Judge Rich has authored a series of articles strongly advocating the erroneous legal thinking that characterizes many CCPA opinions, including the majority opinion below. In Rich, *Congressional Intent or Who Wrote the 1952 Patent Act*, 61 Patent Procurement and Exploitation 70 (BNA 1963), the judge alleged that the 1952 Act was intended to create "law superior to that which may be derived from any prior court opinion." As with this one, the themes of other Rich articles can often be gleaned from their titles. See Rich, *Principles of Patentability*, 28 G.W.L.Rev. 393 (1960); Rich, *The Vague Concept of "invention" as Replaced by § 103 of the 1952 Patent Act*, 8 Idea 136 (1964); Rich, *Laying the Ghost of the "Invention" Requirement*, 1 APLA Q.J. 26 (1972); Rich, "Change", 2 APLA Q.J. 214 (1974).

Wrote Judge Rich in 1975, "[i]n the only two CCPA patent cases so far decided by the Supreme Court on certiorari . . . the

Perpetuating that error, the opinion below construes 35 U.S.C. § 101 and § 103 in derogation of this Court's applicable precedent before and after 1952.

In regard to § 103, this Court has held repeatedly that the judicial test of "invention" and the "unobviousness" language of § 103 commonly implement the "standard expressed in the Constitution [which] may not be ignored," *Graham v. John Deere Co.*, 383 U.S. 1, 6 and, hence, are but different labels for the same unvarying patentability standard.³⁹

Similarly, the category "new" in § 101's list of six categories of subject matter that may be patented⁴⁰ accords with "the limits of the constitutional grant" which

CCPA has been reversed. Erroneously, of course. I have a favorite axiom: "The higher you go, the less they know." Rich, *How Systematic is the Patent System?*, 57 J.Pat.Off.Soc'y 696 (1975).

³⁹ *Graham* emphasizes that the patentability "standard [is] expressed in the Constitution and it may not be ignored" (*ibid.* at 6), and that 35 U.S.C. § 103 "comports with the constitutional strictures" (*id.* at 17) only if construed to embrace that standard which "has remained invariable in this Court" (*id.* at 19), as distinguished from the "relaxed standard" (*id.* at 19) which the Court was unsuccessfully "urged to find".

In 1976, the Court, reaffirming *Graham*, emphasized again that:

As a judicial test 'invention'—i.e., 'an exercise of the inventive faculty,' *McClain v. Ortmyer*, 141 U.S. 419, 427 . . . (1891)—has long been regarded as an absolute prerequisite to patentability. See, e.g., *Keystone Driller Co. v. Northwest Engineering Corp.*, 294 U.S. 42 . . . (1935); *Sharp v. Stamping Co.*, 103 U.S. 205 . . . (1881); *Hotchkiss v. Greenwood*, 11 How. 248 . . . (1851).

and that in *Graham*:

We held that § 103 "was not intended by Congress to change the general level of patentable invention" but was meant "merely as a codification of judicial precedents. . . ." *Dann v. Johnston*, 425 U.S. 219, 225-6 (1976).

⁴⁰ I.e., subject matter that is (1) "new," and (2) "useful," and is also a (3) "process," (4) "machine," (5) "manufacture," or (6) "composition of matter".

preclude Congress from "authoriz[ing] the issuance of patents whose effects are to remove existent knowledge from the public domain" (*ibid.*).⁴¹

Notwithstanding this settled law, the CCPA has held that "the Constitutional clause . . . set no standards for the patentability of individual inventions" (Pet. App. 8a-9a). It has charged that the "briefs filed by the Solicitor General" in *Flook* "badly, and with a seeming sense of purpose, confuse the statutory-categories requirement of § 101 with a requirement for the existence of 'invention'" (Pet. App. 17a) and advance "subversive nonsense" (Pet. App. 19a) which this Court "unfortunately and apparently unconscious[ly] though clear[ly]" adopted in *Flook* (Pet. App. 10a).

Whatever "nonsense" may be involved is found, not in this Court's *Flook* opinion or in the associated briefs of the Solicitor General but in the bankrupt challenges to settled law advanced by the CCPA majority.

That majority opinion emphasizes the "nonsense" that:

*Prior art is irrelevant to the determination of statutory subject matter under § 101. An invention can be statutory subject matter and be 100% old.*⁴²

⁴¹ Thus, the Court, following *Graham*, held the patent at issue invalid in *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 62, n.4 (1969) for absence "here [of] the element 'new' . . . [f]or . . . the combination patent added nothing to the inherent characteristics . . . of the [prior art]."

See also, *Cochrane v. Badische Anilin*, *supra*, p. 15, n. 23, in which the Court held that a dye product which had been in the public domain for years was not a "new" composition of matter within the meaning of the 1870 Act.

⁴² Compare the contrary rulings of this Court in *Anderson's-Black Rock*, *supra*, p. 26, n. 41, and in *Cochrane*, *supra*, p. 15, n. 23. See also the House Report on the 1952 Patent Act, quoted *supra*, n. 38, p. 24.

devoid of any utility⁴³ or entirely obvious. (Emphasis by the court; Pet. App. 19a.)

In furtherance of its charges against the Solicitor General, but with no reference to this Court's contrary rulings in *Graham*, *Dann*, and *Anderson's-Black Rock*, *supra*, and in *Sakraida v. Ag Pro*, 425 U.S. 273 (1976), the CCPA asserts that "there has not been a requirement for 'invention' in the patentability sense in the laws since 1952—the requirement was replaced by the § 103 requirement for nonobviousness" (Pet. App. 17a).⁴⁴

These CCPA errors should be repudiated firmly by this Court, as they have been in the past. It is singularly important, however, that the Court not become so intent on dispelling these errors that it also reverses the CCPA's judgment.

CONCLUSION

The public policy of the patent system is to "promote progress of science and useful arts," by inducing timely public disclosure of technologically significant inventions. Within the constitutional and statutory framework, that policy is best served by a liberal construction of § 101's categories of patentable subject matter. Otherwise, the inventors of the most progressive new discoveries will be among those who have "no reason to apply for a patent"

⁴³ In contrast, this Court in *Brenner*, *supra*, held flatly that the word "useful" in § 101 continues "the concept of utility [which] has maintained a central place in all of our patent legislation, beginning with the first patent law in 1790." 383 U.S. at 529, and that "Congress has struck the balance on the side of nonpatentability unless 'utility' is shown." *Ibid.* at 535.

⁴⁴ These contentions are best understood in the context of a continuing effort, endorsed by Judge Rich and the CCPA, to induce this Court to reverse its ruling in *Graham* and "find in § 103 a relaxed standard" consequent from the alleged "substitution" of "unobviousness" for "invention" as the dispositive patentability criterion.

because those discoveries fall "in the area of nonpatentable subject matter." *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 483 (1974).

The petitioner itself has properly accommodated the requirements of § 112 to microbiological process inventions; hence, such constraints should no longer preclude the patenting of manufactured microorganisms. The petitioner's invitation to this Court to impose such artificial constraints, in derogation of *Dubilier, supra*, p. 8, n. 10, by reading "into the patent laws" a "nonliving" limitation for "manufacture[s]," "which the legislature has not expressed," should be rejected.

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